

IN THE CLAIMS

1. (Currently Amended) A laminated glazing material with properties of acoustic insulation and mechanical strength, said glazing material comprising two glass sheets and a single-ply intermediate layer abutting the two glass sheets, the intermediate layer being in the form of a polymeric film and having a thickness,

wherein the intermediate layer primarily satisfies acoustic property criteria defined by a bar of 9 cm length and 3 cm width, made of laminated glass comprising two glass sheets of 4 mm thickness joined by the intermediate layer having a thickness of 2 mm, has a critical frequency which differs at most by 35% from that of a glass bar having a same length, a same width and a thickness of 4 mm, and

wherein the intermediate layer secondarily satisfies mechanical strength criteria based upon tearing resistance characteristics by setting the thickness of the intermediate layer is equal to at least  $d_{ref} J_{ref}/J_c$ , where  $J_c$  is a critical energy value specific to a material of the intermediate layer and representative of an energy necessary for propagation of a crack initiated in the intermediate layer,  $J_{ref}$  is a reference critical energy value which corresponds to a critical energy value of a polyvinyl butyral (PVB) film and is equal to 35,100 J/m<sup>2</sup> for a temperature of 20°C and for a drawing rate of 100 mm/min applied to the PVB film, and  $d_{ref}$  is a reference thickness which corresponds to that of the PVB film and is equal to 0.38 mm,

and

wherein the polymer film is a composite comprising a polymer and reinforcing fibers embedded in the polymer.

2. (Canceled)

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3. (Currently Amended) A laminated glazing material with properties of acoustic insulation and mechanical strength, said glazing material comprising two glass sheets and a single-ply intermediate layer abutting the two glass sheets, the intermediate layer being in the form of a polymeric film and having a thickness,

wherein the intermediate layer primarily satisfies acoustic property criteria by having a loss factor greater than 0.6 and a shear modulus of between  $1 \times 10^8$  and  $2 \times 10^7$  N/m<sup>2</sup> in a temperature range of between 10 and 60°C and in a frequency range of between 50 and 10,000 Hz, and

wherein the intermediate layer secondarily satisfies mechanical strength criteria based upon tearing resistance characteristics by setting the thickness of the intermediate layer is equal to at least  $d_{ref} J_{ref}/J_c$ , where  $J_c$  is a critical energy value specific to a material of the intermediate layer and representative of an energy necessary for propagation of a crack initiated in the intermediate layer,  $J_{ref}$  is a reference critical energy value which corresponds to a critical energy value of a polyvinyl butyral (PVB) film and is equal to 35,100 J/m<sup>2</sup> for a temperature of 20°C and for a drawing rate of 100 mm/min applied to the PVB film, and  $d_{ref}$  is a reference thickness which corresponds to that of the PVB film and is equal to 0.38 mm, and

wherein the polymer film is a composite comprising a polymer and reinforcing fibers embedded in the polymer.

4.-6. (Canceled)

7. (Currently Amended) A polymer film having a thickness for use as only one intermediate layer of a laminated glazing material,

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wherein the intermediate layer primarily satisfies acoustic property criteria defined by a bar of 9 cm length and 3 cm width, made of laminated glass comprising two glass sheets of 4 mm thickness joined by the intermediate layer having a thickness of 2 mm, has a critical frequency which differs at most by 35% from that of a glass bar having a same length, a same width and a thickness of 4 mm, and

wherein the intermediate layer secondarily satisfies mechanical strength criteria based upon tearing resistance characteristics by setting the thickness of the intermediate layer equal to at least  $d_{ref} J_{ref}/J_c$ , where  $J_c$  is a critical energy value specific to a material of the intermediate layer and representative of an energy necessary for propagation of a crack initiated in the intermediate layer,  $J_{ref}$  is a reference critical energy value which corresponds to a critical energy value of a polyvinyl butyral (PVB) film and is equal to  $35,100 \text{ J/m}^2$  for a temperature of  $20^\circ\text{C}$  and for a drawing rate of 100 mm/min applied to the PVB film, and  $d_{ref}$  is a reference thickness which corresponds to that of the PVB film and is equal to 0.38 mm,  
and

wherein the intermediate layer is a composite comprising a polymer and reinforcing fibers embedded in the polymer.

8.-10. (Canceled)

11. (Currently Amended) A polymer film having a thickness for use as only one intermediate layer of a laminated glazing material,

wherein the intermediate layer primarily satisfies acoustic property criteria by having a loss factor greater than 0.6 and a shear modulus of between  $1 \times 10^8$  and  $2 \times 10^7 \text{ N/m}^2$  in a

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temperature range of between 10 and 60°C and in a frequency range of between 50 and 10,000 Hz, and

wherein the intermediate layer secondarily satisfies mechanical strength criteria based upon tearing resistance characteristics by setting the thickness of the intermediate layer equal to at least  $d_{ref} J_{ref}/J_c$ , where  $J_c$  is a critical energy value specific to a material of the intermediate layer and representative of an energy necessary for propagation of a crack initiated in the intermediate layer,  $J_{ref}$  is a reference critical energy value which corresponds to a critical energy value of a polyvinyl butyral (PVB) film and is equal to 35,100 J/m<sup>2</sup> for a temperature of 20°C and for a drawing rate of 100 mm/min applied to the PVB film, and  $d_{ref}$  is a reference thickness which corresponds to that of the PVB film and is equal to 0.38 mm,

and

wherein the intermediate layer is a composite comprising a polymer and reinforcing fibers embedded in the polymer.

12.-19. (Canceled)

20. (New) A method for selecting an intermediate layer to manufacture a laminated glazing with acoustic insulation and mechanical strength properties, said glazing comprising two glass sheets and a monolayer interlayer in the form of a polymeric film, the method comprising:

choosing the interlayer for its acoustic insulation properties, wherein said interlayer satisfies acoustic insulation properties when a bar 9 cm long and 3 cm wide, consisting of a laminated glass comprising two glass sheets 4 mm thick joined by the interlayer with a

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thickness of 2 mm, has a critical frequency which differs by at most 35% from that of a glass bar having a same length, a same width and a 4 mm thickness;

evaluating a  $J_c$  critical energy value specific to the material of the interlayer and representative of an energy needed to propagate a crack initiated in the interlayer; and

calculating the thickness of the interlayer for satisfying mechanical strength criteria, the thickness being equal to at least  $d_{ref} J_{ref}/J_c$ , where  $J_{ref}$  is a critical reference energy which corresponds to a critical energy of a film of polyvinyl butyral (PVB) and is equal to 35,100  $J/m^2$  for a temperature of 20°C and for a pull rate on the PVB film of 100 mm/min applied to the PVB film, and  $d_{ref}$  is a reference thickness which corresponds to that of the PVB film and is equal to 0.38 mm.

21. (New) A method for selecting an intermediate layer to manufacture a laminated glazing with acoustic insulation and mechanical strength properties, said glazing comprising two glass sheets and a monolayer interlayer in the form of a polymeric film, the method comprising:

choosing the interlayer for its acoustic insulation properties, wherein said interlayer satisfies acoustic insulation properties when the interlayer has a loss factor  $\tan\delta$  greater than 0.6 and a shear modulus  $G'$  between  $1 \times 10^8$  and  $2 \times 10^7 N/m^2$ , in a temperature range between 10 and 60°C and a frequency range between 50 and 10,000 Hz;

evaluating a  $J_c$  critical energy value specific to the material of the interlayer and representative of an energy needed to propagate a crack initiated in the interlayer; and

calculating the thickness of the interlayer for satisfying mechanical strength criteria, the thickness being equal to at least  $d_{ref} J_{ref}/J_c$ , where  $J_{ref}$  is a critical reference energy which

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corresponds to a critical energy of a film of polyvinyl butyral (PVB) and is equal to 35,100 J/m<sup>2</sup> for a temperature of 20°C and for a pull rate on the PVB film of 100 mm/min applied to the PVB film, and  $d_{ref}$  is a reference thickness which corresponds to that of the PVB film and is equal to 0.38 mm.

22. (New) A method of determining a tearing strength of a polymeric film of thickness  $d_1$ , intended to constitute the interlayer of a laminated glazing unit, comprising:

determining a critical energy  $J_c$  of the interlayer, the critical energy being representative of an energy needed to propagate a crack initiated in the interlayer;

calculating a thickness-related critical energy  $\hat{J}_c$ , defined by an equation  $\hat{J}_c = J_c d_1$ ; and

comparing  $\hat{J}_c$  with a reference value  $\hat{J}_{ref}$  representative of a polyvinyl butyral film having a thickness of 0.38 mm thickness and equal to 13.3 J/m,

wherein the interlayer meets the tearing strength criterion when  $\hat{J}_c > \hat{J}_{ref}$ .